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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,113	03/19/2001	Gabriele Nelles	450117-03033	2990

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EXAMINER

HON, SOW FUN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 02/12/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,113

Applicant(s)

NELLES ET AL.

Examiner

Sow-Fun Hon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-73 is/are pending in the application.
- 4a) Of the above claim(s) 1-29 and 52-73 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>6</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 30-51 in Paper No. 8 is acknowledged. The traversal is on the ground(s) that the claims of Groups I and IV are directed to the same general inventive concept as the claims of Group II because all of the claims include the same corresponding technical features. This is not found persuasive because EP0887667A2 teaches the substrate structure which is the technical feature common to the groups, meaning that the common technical feature is not inventive, not being a contribution over the prior art.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 30-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. In claim 30:

- a. It is unclear what the term "neurite" means. Does it mean the cell of a sentient being?
- b. It is unclear whether the multilayer of liquid crystal material mean layers of different liquid crystal material.

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- c. It is unclear what a combined alignment layer is. Does it mean that there are several different types of alignment materials put together in one layer?
5. In claim 31, does the term "cell" mean a tissue cell of a sentient being? Furthermore, how is a neuron distinguishable from a cell?
6. In claim 35: the term "structure" should be better defined as a "repeat unit" since it is the formula of a repeat unit of the polymer.
7. In claim 44, it is unclear what the terms "P6a12, P6a10, P8a10, P10a10, P8a12, P10a12" mean. These appear to be trademarks. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name.
8. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of

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the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

d. In claim 32, the term "glass substrate" is the broad limitation followed by the narrower recitation of "preferably covered with ...".

e. In claims 37, 38 and 51, the ranges "from 10 to 200 nm", "from 10 to 150 nm" and "from 20 to 350 nm" are the broad limitations followed by the narrower recitation of "preferably 200 nm".

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 30-34, 39, 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Grainger et al. (US 5,686,549).

Grainger et al. teaches a polymer having a plurality of pendant anchoring chains on a substrate, and a plurality of side chains substituted with a functional group (column 1, lines 60-68 and column 2, lines 1-5). The polymers recited are polyimide, polyamide, polyacrylate and polymethacrylate (column 2, lines 45-65) and polyvinyl alcohol (column 12, lines 50-65). The polymer is taught to also comprise polypeptide, a liquid crystal molecule, a polar adhesive group and a chromophore (column 5, lines 1-20). Poly(benzyl)glutamate is given as an example of a

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polypeptide (column 11, lines 30-60). Grainger et al. teaches that the polymer is bound across the surface of a substrate in a predetermined alignment (pattern) as points of attachment for cell growth (column 15, lines 10-20) thus acting as an alignment layer on the substrate for cell growth. The substrate is glass (silica) (column 12, lines 55-60 and column 13, lines 30-50). The polymers are also useful as adhesives, having a silane (silyl) group, in the formation of laminates (column 13, lines 1-35).

11. Claims 30-33, 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Georger, Jr. et al. (US 5,510,628).

Georger, Jr. et al. teaches the alignment (precise positioning) of cells for controlled growth with an alignment layer (cell adhesion promoter) on a conductive layer of an electrode arrangement (metal microelectrodes) on a glass substrate (column 15, lines 20-25, 55-68). The cells are neurons (column 2, lines 55-60). The alignment (patterned for selective adhesion and outgrowth) layer (film) is a polymer (column 3, lines 45-65, column 7, lines 5-25) such as (poly)peptides bound to glass surfaces (column 14, lines 55-65).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

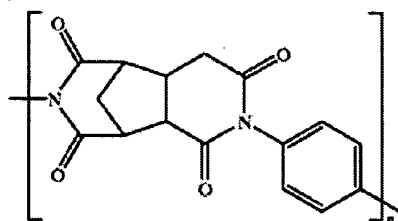
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 30, 32-35, 37-43, 48, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata (US 6,606,113).

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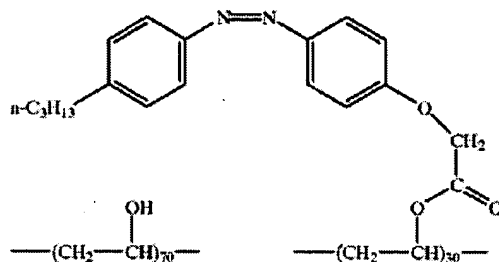
Kawata has a glass support (column 5, lines 55-60) with an alignment layer formed with a chromophore (photochromic compound) which includes azobenzene (column 6, lines 5-50) of thickness 100 nm to 5000 nm (μm) (column 7, lines 60-65). The chromophore is reacted (chemically bound) to a polymer which is a polyvinyl alcohol) (column 7, lines 10-40). A polyimide with a homolog variation of the claimed structure (a phenyl instead of a biphenyl on one side) (column 15, lines 5-20) is shown below:

(Polymide)



and a polyvinyl alcohol is taught to be reacted with the azobenzene chromophore shown below wherein the vinyl alcohol repeat unit is an insert on the bottom left :

(Photo isomerization polymer)



The azobenzene attached to the polyvinyl alcohol via the ester linkage yields an azobenzene sidechain liquid crystalline polyester as seen above, and a longer alkyl chain on the very tip of the azobenzene is a homolog.

14. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al. (US 4,857,227).

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Adams et al. teaches smectic liquid crystal molecules used in ferroelectric electrooptic display devices (column 1, lines 5-30) comprising 4-hydroxy-4'-biphenyl carbonitrile (column 8, lines 30-45). 4-octyl and 4-pentyl-4-hydroxy-4'-biphenyl carbonitrile are homologues.

Although Adams et al. fails to teach an alignment layer, electrooptic display devices (better known as liquid crystal display devices) with alignment layers aligning the liquid crystal material layer are notoriously well known in the art.

15. Claims 39, 46-47, 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grainger et al. in view of Kawata.

Grainger et al. teaches a polymer having a plurality of pendant anchoring chains on a substrate, and a plurality of side chains substituted with a functional group (column 1, lines 60-68 and column 2, lines 1-5). The polymers recited are polyimide, polyamide, polyacrylate and polymethacrylate (column 2, lines 45-65) and polyvinyl alcohol (column 12, lines 50-65). Polyacrylamide is but a copolymer of polyamide and polyacrylate.

Grainger et al. teaches that the polymer also comprises polypeptide, a liquid crystal molecule, a polar adhesive group and a chromophore (column 5, lines 1-20). Poly(benzyl)glutamate is given as an example of a polypeptide (column 11, lines 30-60).

Grainger et al., however, fails to teach that the chromophore is azobenzene.

Kawata teaches a glass support (column 5, lines 55-60) with an alignment layer, formed with a chromophore (photochromic compound) which includes azobenzene (column 6, lines 5-50), of thickness 100 nm to 5000 nm (μm) (column 7, lines 60-65). The chromophore is reacted (chemically bound) to a polymer which is a polyvinyl alcohol (column 7, lines 10-40) and a polyimide (column 15, lines 5-20). The alignment defect for an alignment layer formed with the

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azobenzene chromophore was found to be lower than one formed without (column 17, lines 1-50).

Because Kawata teaches that the number of alignment defects for an alignment layer formed with the azobenzene chromophore is lower than for one formed without, and Grainger et al. teaches that polyvinyl alcohol, polyacrylate, polyimide and polypeptides are equivalent polymeric alignment materials, it would have been obvious to one of ordinary skill in the art to have used the azobenzene chromophore of Kawata as the chromophore in the alignment material of Grainger et al. in order to obtain an alignment layer with less alignment defects.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (703)308-3265. The examiner can normally be reached Monday to Friday from 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (703)308-4251. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

8A
Sow-Fun Hon
02/07/03


HAROLD PYON
SUPERVISORY PATENT EXAMINER 1772 2/19/03